

Date: Thursday, 04/10/2007 10:38:49 AM
User: Linda Lacelle

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
Job Number : 35006
Estimate Number : 10559
P.O. Number : *N/A*
This Issue : 04/10/2007 S.O. No. : *N/A*
Prsht Rev. : NC
First Issue : *N/A* Type : LANDING GEAR
Previous Run : 33541
Written By :
Checked & Approved By :
Comment : Est Rev:E 04.02.16 Reformat; Added D3189-1 K/DS
Est Rev:F 06-03-29 Remove Coments on Pick List JLM
Est Rev:G 06.12.08 per ECN 886 EC
Est Rev:H 07-04-30 As per Rev D JLM

Drawing Name : HIGH AFT X-TUBE 412
Part Number : D412664203
Drawing Number : D412-664-243 REV D
Project Number : N/A
Drawing Revision : D
Material : *N/A*
Due Date : 11/10/2007 Qty: 1 Um: Each

DART		TEL: 1-613-632-3336 FAX: 1-613-632-4443	
TRANSPORT CANADA APPROVAL # 09-39			
PN	D412-664-203	CHG	CHG006
DESC	Crosstube Aft High	STC	SH01-9
LOT	B32227	STC	SR01298NY
MODEL	Bell 412	STC	
MADE IN CANADA			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
1.0	ENGINEERING 1	ENGINEERING RESOURCE #1



Comment: ENGINEERING RESOURCE #1
PULL FROM STOCK:

1 X D412-664-203 B32227

AD 07/10/04

2.0	D412664203	Crosstube Aft High
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
Crosstube Aft High

AD 07/10/04

3.0	ENGINEERING 1	ENGINEERING RESOURCE #1
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Comment: ENGINEERING RESOURCE #1
-CYCLE TUBE SEVERAL TIMES
UP TO 6000LBS, IN DEFLECTION RIG

-VISUALLY INSPECT WITH MAGNIFYING GLASS
FOR ANY CRACKS IN PAINT

-IF CRACKS ARE FOUND, LPI

J *AD* 07/10/04

4.0	SPRAY PAINTING	SPRAY PAINTING
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Comment: SPRAY PAINTING
REPRIME/SPRAY PAINT
AS NECESSARY

DT 8550/DT 8551

AT 07-10-17

Date: Thursday, 04/10/2007 10:38:49 AM
User: Linda Lacelle

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: HIGH AFT X-TUBE 412

Job Number: 35006

Part Number: D412664203

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC14

INSPECT SPRAY PAINT



JA-10-23

①



Comment: INSPECT SPRAY PAINT

6.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1
ENSURE KIT IS COMPLETE

RE-PACKAGE PER PPP
USING NEW B/N
NEW LABELS REQ'D

ACH 4

En 2/10/24

2/10/24

7.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

10/10/24

Job Completion



10/10/24

5.1) Pick

CLAMP/MS21920-28 B 104423 x4

chafing shield/3189-1 B 30201 x2

Abrasion strip/D2856-600 B26650

CLAMP/MS21920-30 B100154 x2

Robber cushion/D359-506-3570 B35126 x2

ml
07/10/18

5.2 Assemble As per Dwg Rev. D.

ml 07/10/18 (1)

QC5

Inspect Assy

JA-10-23 ①

Jason Murdoch

From: Mike Petsche [mpetsche@dartaero.com]
Sent: Wednesday, October 03, 2007 4:15 PM
To: Bill Beckett; 'David Shepherd'; 'Mike O'Reilly'; 'Peggy McDonald'; 'Spyke Whiting'; 'Dan Stow'; 'Jason Murdoch'
Subject: FW: Crosstubes

With regard to the email from Tim Fox, here is the plan while we are waiting for the parts back from AAI:

Three sample crosstubes have been LPI'ed. One new, (actually a customer return, but never flown) and two crosstubes that have been yielded in previous deflection testing. The yielded parts have only ever been primed. Only one of the yielded parts showed any evidence of possible cracking. They were small cracks perpendicular to the axis of the tube, similar to the ones on the failed Asesa tubes, ("stretchmarks"). The primer will be stripped from this tube and the LPI will be repeated to see if the crack was only in the primer or whether the cracking was in the aluminium. (Again, this tube was a part that was scrapped during deflection testing)

It was also determined that you can't really effectively LPI a tube that has been painted. The LPI on the new tube was inconclusive.

We will now take a new tube out of stock and cycle it several times up to 6000lbs in our deflection rig. It has been determined that this would be a safe load to apply to the crosstube without compromising its life. It will then be removed from the rig and visually inspected with a magnifying glass. Specifically, the paint will be examined to identify any possible cracks in the paint. If we see any cracks in the paint, we will LPI it.

Once we get the parts back from AAI, we will strip the paint in the "areas of concern" and perform LPI.

From there we will decide how to proceed.

Mike Petsche

Design Manager

DART Aerospace

ph: 613-632-5200 ext. 250

mobile: 514-833-1657

Skype: mike.petsche

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.488 / Virus Database: 269.14.0/1046 - Release Date: 03/10/2007 10:08 AM

No virus found in this outgoing message.

10/4/2007

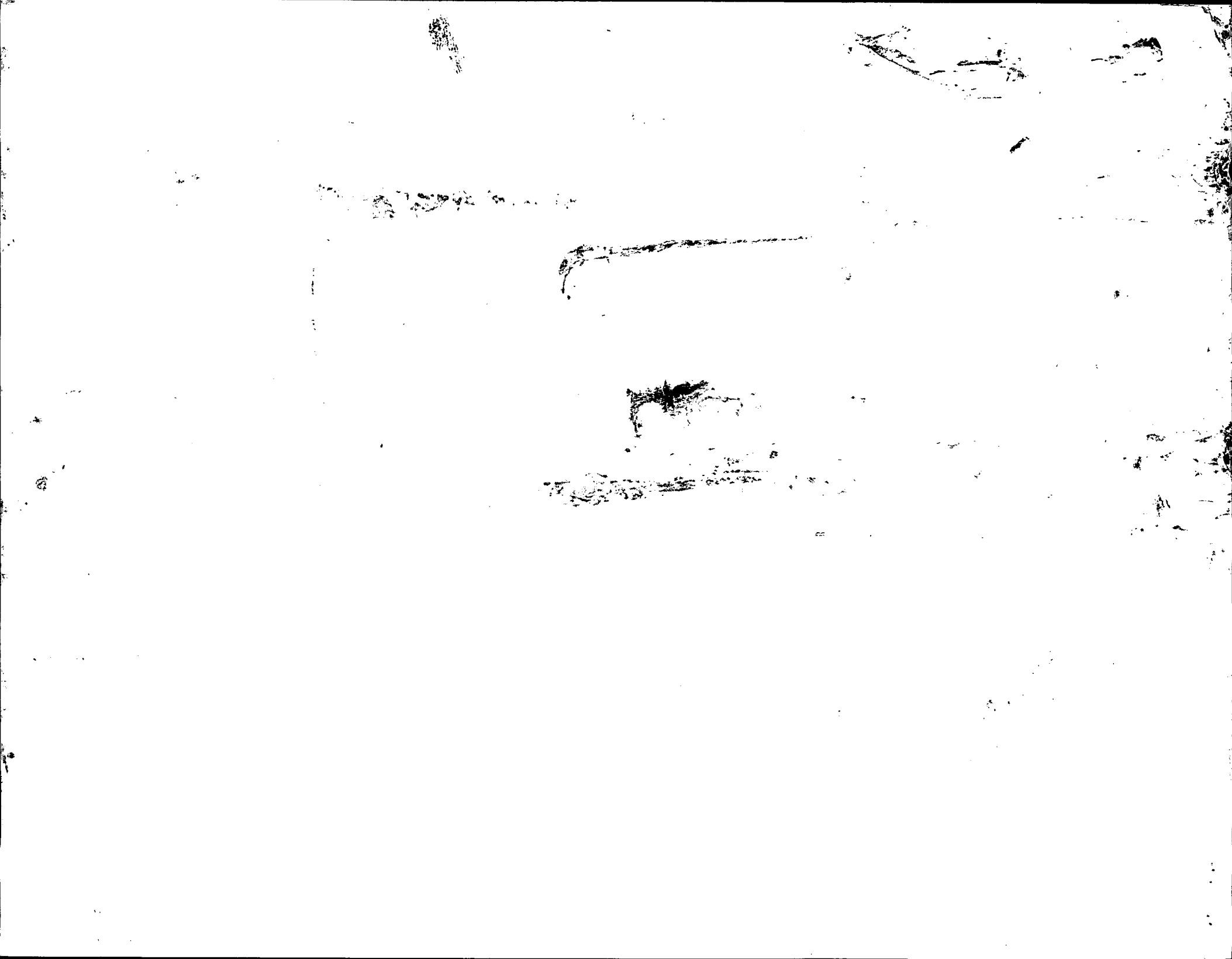
L Lacelle

From: Dan Stow [dstow@dartaero.com]
Sent: October 4, 2007 7:05 AM
To: 'Chantelle Lavoie'; Linda Lacelle (Linda Lacelle)
Cc: Bill Beckett (Bill Beckett)
Subject: D412-664-203 B32227

Please be advised that I have removed a D412-664-203 B32227 from stock so that we can test the affects of cycling on the paint. The crosstube will probably have to be touched up but it will be returned to stock.

Dan Stow
Technical Support
Dart Aerospace
Tel: 613.632.5200
Cell: 613.676.0992
dstow@dartaero.com

04/10/2007



DART

DESIGN PH	DRAWN BY PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED GP	APPROVED [Signature]	DRAWING NO. D412-664-243	REV. D SHEET 1 OF 3
DATE 07.03.09		TITLE CROSSTUBE ASSEMBLY (412 HI AFT) NTS	
A	01.10.17	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	06.10.27	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398 MS21920-32 WAS MS21920-30	
D	07.03.09	REMOVE D2732-058, CHANGE TO D3595-063-570	

RELEASE07.04.24 **[Signature]**

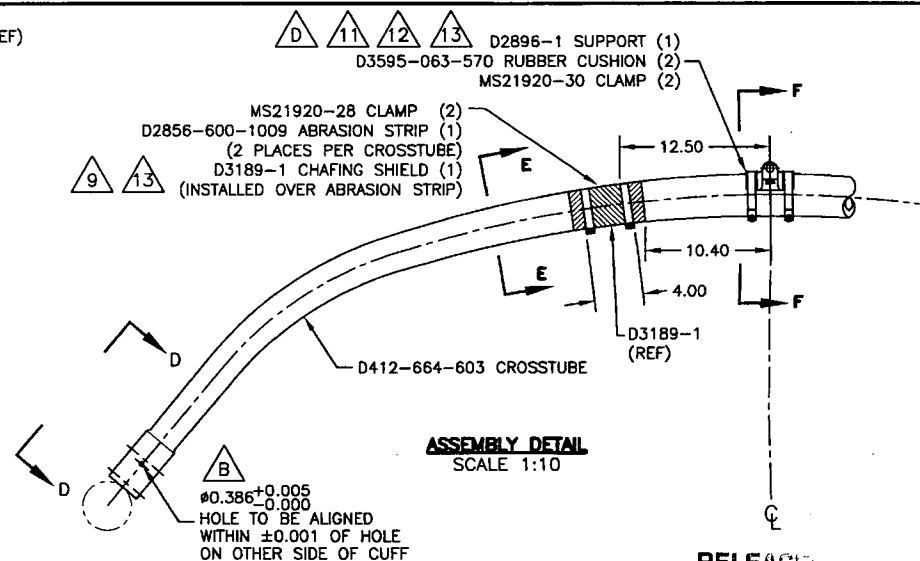
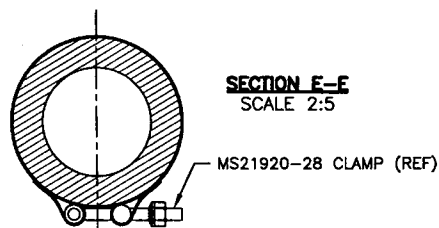
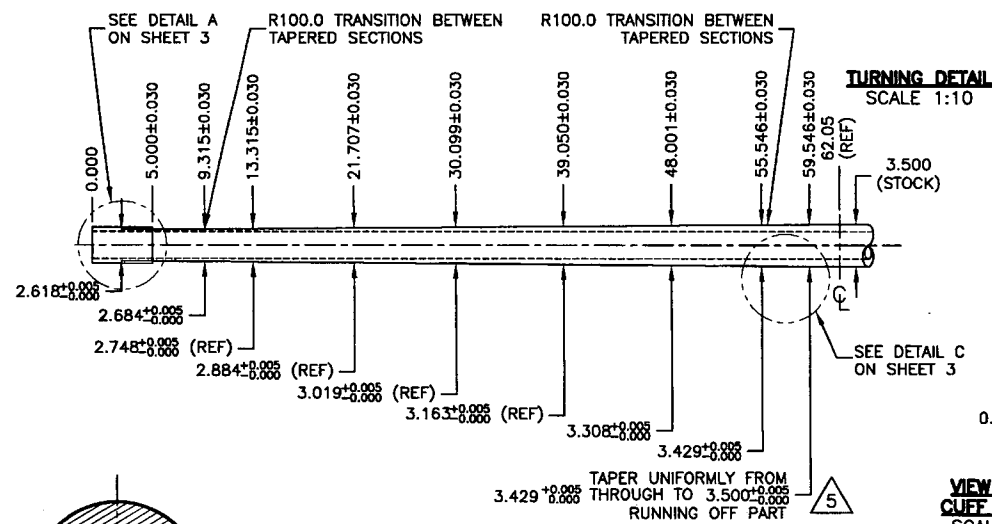
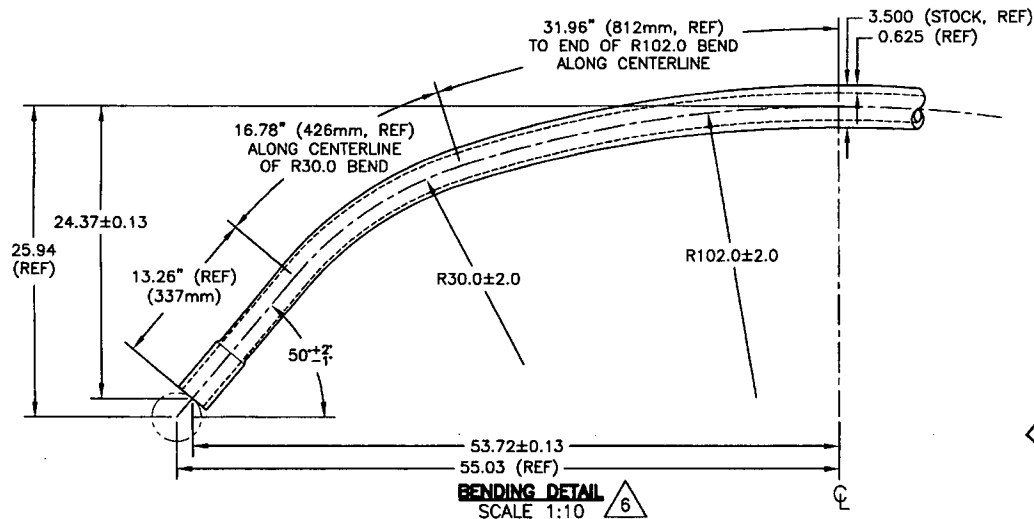
Qty	Part Number	Description
X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
1	D6009-129	CROSSTUBE
2	D3595-063-570	RUBBER CUSHION
1	D2896-1	SUPPORT
2	D2856-600-1009	ABRASION STRIP
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
2	D3189-1	CHAFING SHIELD
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

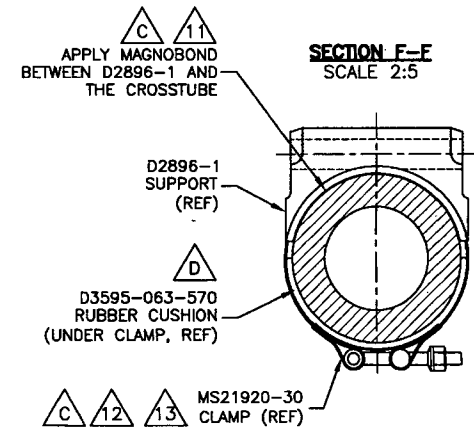
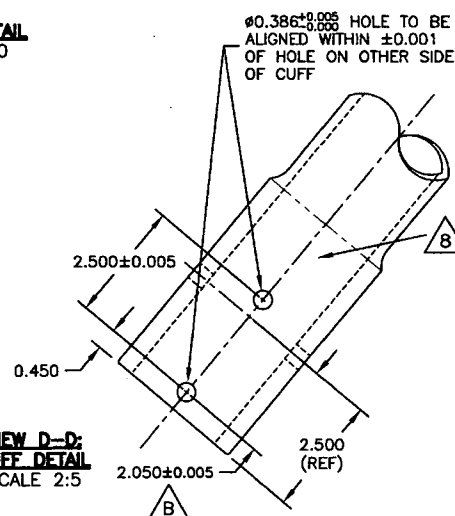
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 124.09±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

4/0
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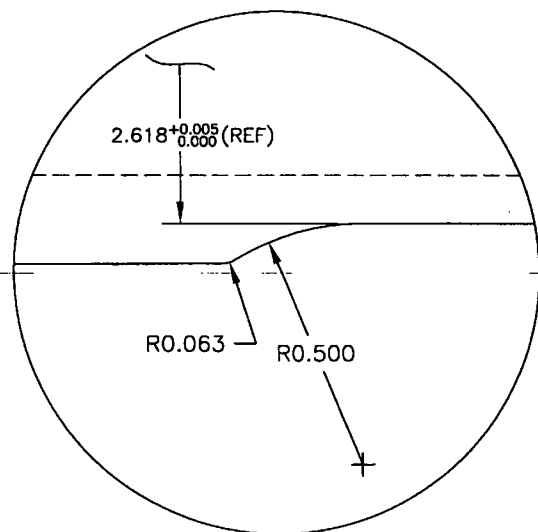
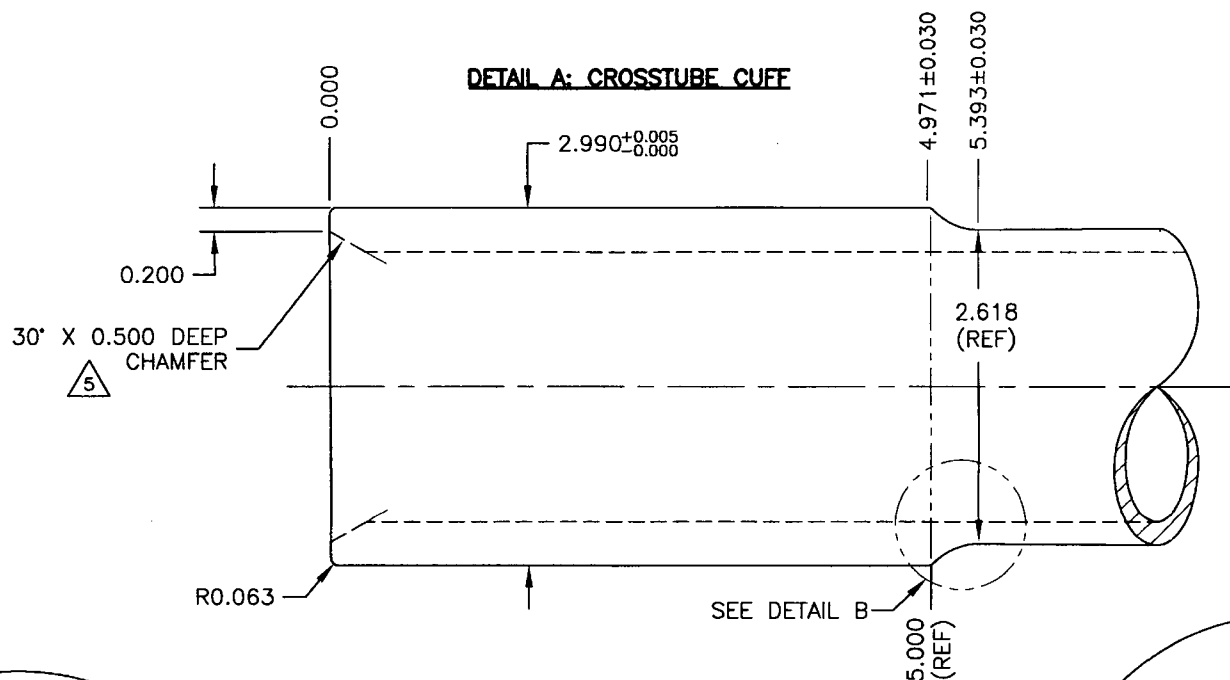
RELEASED
07 04 24



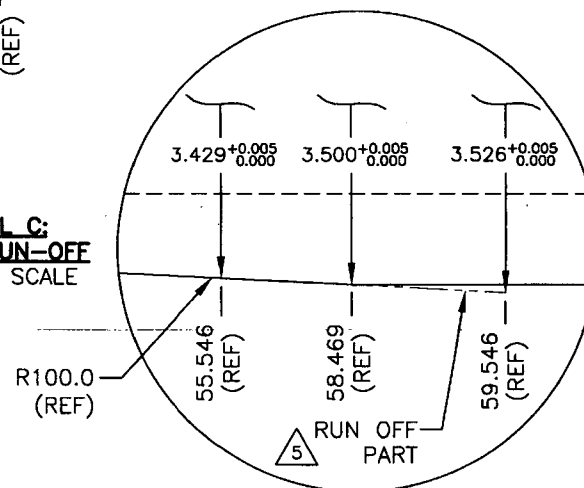
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THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED PH	APPROVED PH	DRAWING NO. D412-664-243	REV. D SHEET 2 OF 3
DATE 07.03.09		TITLE CROSSTUBE ASSEMBLY (412 HI AFT)		SCALE 1:10	

RELEASED
07-04-244
REF ECN 489

DETAIL A: CROSSTUBE CUFF



**DETAIL C:
TAPER RUN-OFF
NOT TO SCALE**



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DESIGN PH	DRAWN BY PH	DART	DART AEROSPACE LTD. WARRICKSURY, ONTARIO, CANADA
CHECKED J	APPROVED JH	DRAWING NO. D412-664-243	REV. D SHEET 3 OF 3
DATE 07.03.09	TITLE CROSSTUBE ASSEMBLY (412 HI AFT) 1:1		